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DEPRECIATION AND RATE CONTROL

A FURTHER DISCUSSION

SUMMARY

The problem of depreciation in retroactive regulation, 546. — Principle of replacement cost discussed, 547.—Absurdity of using replacement cost new, 549. — Objections to deduction of depreciation answered, 552. — Depreciation under the principle of original cost, 555.

SHOULD depreciation be deducted in fixing the value of railroads and public utilities for rate-making purposes ? The question has been discussed pro and con in a series of articles appearing in recent numbers of this Journal.[1] Just at present, there is urgent need of arriving at a satisfactory conclusion in view of the pending federal valuation of railways. The controversy, however, can as yet hardly be considered settled, and a renewal of the discussion may not be out of order.

One point at least has already been made clear: that a decision as to the correct policy for the future would not of itself determine the proper treatment of depreciation already accrued. In the case of depreciation already accrued, investors have been given no previous warning that depreciation must be charged off. Therefore the question arises whether it is fair to make any deduction *now* in determining the fair value. It is this special problem of retroactive regulation that has been the subject of the recent controversy, and the present comments will be confined to this one issue.

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[1] Allyn A. Young, " Depreciation and Rate Control," Quarterly Journal of Economics, vol. xxviii, August, 1914, pp 630–663; Joseph S. Davis & Allyn A. Young, " Depreciation and Rate Control," " A Criticism ", " A Reply "; " A Rejoinder "; " Concluding Remarks ". Ibid , vol. xxix, February, 1915, pp 362–400

John Bauer, " Depreciation and Rate Control, a Question of Justice." Ibid., vol. xxix, May, 1915, pp 651–659.

No one denies that railways must make allowance for renewals actually required in order to maintain the property at good operating efficiency. But depreciation begins before these renewals need be made. Should this unrealized depreciation be deducted in fixing the value ? Professor Young has defended the stand taken by Mr. James E. Allison [1] in denying the propriety of a deduction. After a railroad has been operated for some time, he contends, it settles down to a state of normal depreciation, at which point annual renewal costs are so constant that they may be charged directly to operation. A depreciation reserve is therefore quite unnecessary. The conclusion is drawn that it would be unjust to make any deduction for a depreciation which there has been no reason to anticipate.

Before discussing the point, it is essential to have clearly in mind the general basis of valuation to which the problem of depreciation is applied. Otherwise one misses the underlying principle from which to draw any conclusions. For the sake of limiting the issue, it will be assumed here that cost of reproduction is to be the basis of valuation. The strong probability that reproduction cost will be accepted in rate regulation, so far as existing railway property is concerned, gives it particular importance in current discussions. Professor Young, I take it, does not confine his criticism to those cases where any one basis is used. But he takes exception to decisions of the U. S. Supreme Court,[2] which have specific reference to a reproduction cost valuation.

Why, then, is replacement cost accepted at all as a measure of the " fair value " on which a return is to be allowed ? Not because it represents the actual investment; nor yet the present market value. It is taken to indicate the "normal" or competitive value of the enterprise. It is the cost that would have to be incurred in replacing the present service. Now this is not the place to defend or attack such a method of valuation. But if accepted in practice, it could hardly be justified on any other theory. Obviously, then, the cost that is to be estimated in finding "normal value" is cost of service (*i. e.*, cost of replacing the service), and not cost of identical property. For it is the service alone which is of value to the public and which would have to be replaced if the present railway were not there. The difference between cost of service and cost of property may be very great. In the first place, advance in the arts of construction may make it possible to replace the operating capacity at much lower cost than would be required to duplicate the present antiquated structures. In the second place, modern construction, even when the initial cost is no less, may permit of a net saving through reduction of operating expenses, whether in conducting transportation, or in maintenance and renewals.

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[1] James E. Allison, " Should Public Service Properties be Depreciated ? " Report to St. Louis Public Service Commission, September 11, 1912.

[2] Professor Young refers to Knoxville v. Knoxville Water Co., 212 U. S. 1 (1909) and Minnesota Rate Cases, 230 U. S. 352 (1913). Cf. this Journal, vol. xxviii, August, 1914, pp. 660–662.

Within certain limits, this principle of cost of service is constantly observed in valuation practice; as in the case of antiquated equipment, which is valued below replacement cost even when it is still giving some little service. Nevertheless, courts and commissions have not generally accepted either extreme — cost of service, or cost of identical property — but have made something of a compromise, usually much nearer the property basis than the service basis. This policy, in so far as it is at all rational, is dictated by two considerations. First, the engineering difficulties of estimating cost of reproducing the service in the most economical way are almost prohibitive;[1] second, it is often held that investors should not be obliged to carry the burdens of unexpected obsolescence. But the compromise, if we assume it to be just, does not deny the validity of cost of service as the underlying principle of reproduction cost. It merely makes an exception in view of unusual circumstances. In the main, then, an estimate of the cost of replacing the identical property can be accepted as a basis of fair value, only in so far as it is a rough indication of cost of service.

With this premise as to the general basis of valuation, we may examine the question of depreciation. It is certainly true that if rates were to be based *directly* on an estimate of cost of service, the state of depreciation of the present property would not be considered. For the cost of replacing the service is the same, whether the railroad is new or old. But when the returns are based on cost of the physical property (and this has been assumed in all the previous discussions) the case against deduction for depreciation is not so clear.

Consider two railroads, equal in replacement cost new, and alike in every other respect, except that the one is 50 per cent depreciated, while the other is brand new. If now we accept the proposal to base returns on cost of reproduction new, rather than on cost depreciated, both roads will be entitled to the same profits. But how about rates? Will they likewise be equal? Not at all; the older property, in order to make the same profits, must charge higher rates. For the new railway, simply because it is new, has ahead of it a period of relative freedom from replacement charges — the period during which, according to Professor Young's supposition, it is settling down to a state of "normal" depreciation. Averaging these early low charges with the "normal" ones expected later, we still get lower annual replacement expenses for the new property than for the old. Hence, operating expenses of the newer railroad will be lower to the extent that they are charged with fewer renewals. And as a result, the old road, in order to make an equal return on its cost new, must charge higher rates. It is evident, then, that failure to deduct depreciation would mean a violation of the rate-making principle of replacement cost of service.

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[1] I am informed by Professor E. W. Bemis, of the Advisory Board, Valuation Division, Interstate Commerce Commission, that no attempt is being made in the federal valuation of railways to estimate cost of replacing the service.

It can hardly be contended that business precedent or the conditions of price control in the competitive market have justified investors in expecting such a violation to be made in government regulation. The familiar illustration of the cow is a good one. It has been remarked that in fixing railroad rates, it would be as absurd to take account of the depreciation of the property as it would be to make the price of milk depend on the age of the cow. This may be perfectly true, since it refers to the price. But when the rate of return is concerned, we should need to set up another analogy. We should have to insist that as the cow grows older, the price of milk must steadily rise! The fallacy, then of the argument against deduction of depreciation is that it makes an unwarranted inference from rate of charge to rate of return.

It should be emphasized here that the right of a railroad to earn returns on its cost new would be conceded, even insisted upon, provided only that the rates were to be determined so as to allow no higher annual renewal charges for an old property than for a new one. If, for instance, a piece of equipment with a ten year period of life has already served nine years, it is correct, so long as the equipment gives good service, to allow a return on its cost new. But if this is done, operating expenses on the tenth year should not be charged with the entire cost of replacement. Yet this, in effect, is what the proposal of Professor Young amounts to. For it assumes that capital charges are the same as at the beginning, while charges to maintenance have increased with age.

In the above illustration, which shows that the older railroad must charge higher rates to earn equal profits, the calculations are based on an even distribution of maintenance charges over early and late years. But it is not at all essential to the validity of the example that any such distribution should be assumed to be made, either on the books of the company or in the rates allowed. For the inferiority of the old road over the new — and this is what is meant here by depreciation — is simply the capitalization of the excessive replacement expenses of the older road. These expenses are to be discounted as occurring when the renewals are actually made by the company. It is quite immaterial how they are carried on the books, or when they are allowed for in rates. That is merely an adjustment between the interests of earlier and later consumers; it does not affect the present worth of these expenses.

But the objection is urged that however immaterial may be the distribution of replacement charges in the future, their distribution in the past is vital. For if early rates were so adjusted as just to care for the actually incurred renewals, then future rates must carry the full burden of the higher renewal charges that are not realized till later. Such an assumption as to early rates is, however, quite unwarranted. As Mr. Davis has pointed out, it is an illusion to suppose that railroads have adjusted rates with a view to "adequate" earnings according to any one basis of accounting.

Maximum profits have been the guide, not "just price."

Professor Young is apparently of the opinion that the absence of charges to depreciation has resulted in lower rates, or better service, during the early years of operation. Referring to two plants, one of which has provided a depreciation reserve, while the other has failed to make any provision, he says, " there is a reasonable presumption that one plant has adjusted its investment, its services, and its rates to a higher scale of operating expenses than the other."[1] But does not the history of railroad rates throw much doubt upon the validity of any presumptions as to the effect of accounting methods upon rates or services? Under the principle of pure competitive price, or even of pure monopoly price, such an effect would be expected. But under historical conditions of cut-throat rate wars in one year, followed by pool prices the next, the effect on rates of the absence or presence of a depreciation charge must have been very slight. Of course it is conceivable that historical evidence, not mere assumption, would justify the conclusion that past rates were insufficient to permit of a depreciation reserve, or an amortization of capital. But if history is to be searched at all, the probe must go much deeper. We must determine, not alone whether rates were too low to charge off depreciation, but also whether they were not too high to merit any present allowance for appreciation, as in the case of land values. A reproduction cost basis, however, asks neither of these questions. Partly in view of the lack of historical record, partly out of regard to the adjustment of present investment values to present conditions, it blots out the past and considers only the present. Every claim to value must be materialized in the property. No deduction is made for past earnings, however excessive, or for past increments, however unearned. Conversely, no addition is made to the present depreciated value of the property, even tho such depreciation may not always have been provided for by past earnings. Those who oppose the deduction of depreciation are the first to insist that the fairness of past rates must not now be questioned. In reality, are they not themselves questioning it? For they propose to allow a higher value than is warranted by the present physical condition of the property on the assumption that past rates failed to pay their share of the accrued depreciation. Indeed, if the policy of deducting depreciation is open to criticism at all, it must be on the ground, not that it questions past rates, but that it fails to question them. It refuses to be retrospective.

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[1] This Journal, vol. xxix (1915), p. 386.

The retrospective or historical outlook is evident in Professor Young's admission that it is fair to deduct depreciation when a public utility has of its own accord already provided an adequate reserve. Yet the replacement cost of the property is obviously unaffected by the past policy of charging off depreciation on the books. And has an adequate answer been given to the objection urged by Mr. Davis[1] that such a deduction would amount to unequal treatment of different companies? The voluntary depreciation policy of any company is adopted primarily in the interests of the investors, not of the public. When any reserve is set aside, it is with the legitimate expectation of earning a larger return than could be earned without it. If now the government deducts depreciation only in those cases where the reserve has been made, it thwarts that expectation. The company that has conserved its capital in the past is not allowed one cent more of profits in the future than the company which has disbursed part of its capital in dividends. Certainly this, if anything, is *ex post facto* regulation.

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[1] In this Journal, vol. xxix, February, 1915, pp. 370–371.

Valuation on the basis of cost new is defended on the ground that there has heretofore been no consensus of opinion among accountants, or even in the courts, as to the propriety of charging off accrued depreciation on the books. Doubtless this is true; but what basis of valuation can be found, which has the sanction of universally accepted accounting practice ? Least of all may accounting rules be applied with respect to a reproduction cost theory. For example, the weight of accounting authority and of court decisions, supports the practice of keeping land values on the books at original cost.[1] Yet few would find in that fact alone sufficient argument against the allowance of unearned increment. Moreover, it is hazardous to infer that the failure to set aside a depreciation reserve indicates any failure to realize that depreciation impairs the investment. In many cases, the practice of making no charge to depreciation is due to the expectation that there will be an offsetting appreciation in the value of land and other assets. Of course, a valuation based on reproduction cost *depreciated* gives full opportunity to realize this expectation.

Professor Young has recognized that depreciation reduces the market value of a property, but he states that a valuation for rate-making purposes should be based, not on market values, but on costs. The truth of this statement, however, should not be allowed to conceal the intimate causal connection between market values and costs. The cost of replacing a property depends on the market value of the parts. If any part is depreciated, not only is its value reduced, but the cost of replacing it, after deducting the value of the extra life of the new part, is also less. As to the property as a whole, regarded as a going concern, the failure to deduct depreciation in rate-making would tend to prevent even market value from being reduced. For the market value of the enterprise depends on profits, and by hypothesis no reduction of profits is to be required.

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[1] H. R. Hatfield, Modern Accounting (1913), p. 86.

One possible defense of the cost new valuation is that a new enterprise, tho its early maintenance charges are lower, has the countervailing burden of developing a business.[1] Whatever is gained by lower operating expenses is lost through inadequate gross earnings. In other words, depreciation is held to be offset by " going value." There is a valid point here; and indeed any estimate of cost of reproduction should include the cost of developing a business up to the time when a fair return can be earned. But the amount of this cost is matter for separate determination. It is not at all related to depreciation, and even an approximate offsetting of the one by the other would be a pure coincidence. Indeed, if care is not taken, the amount of " going value " that should be allowed as part of the cost of reproduction will be overestimated. For it is not the developmental expenses actually incurred in the past that are to be calculated, but merely the cost of reproducing a paying business under present favorable conditions of population and wealth. This is one of the few places where cost of reproduction is lower than original cost, and the full benefit of this fact should not be denied the public.

So far, nothing has been said as to the method of estimating depreciation. But if the foregoing reasoning be sound, the amount of depreciation to be deducted should be equivalent to the capitalization of the excessive renewal and replacement charges of an old company as compared to a new one. In other words, it should be an estimate of the amount that the company would theoretically be willing to pay in order to transform the old structure and equipment into new.[1] Strictly speaking, this involves the substitution, not of *identical* new parts, but of the most economical, improved parts. The difficulties, however, in the way of this allowance for obsolescence as distinguished from structural depreciation have already been referred to; and it is not proposed here to discuss them. With reference to structural depreciation, which is the bone of contention in the recent controversy, two conclusions must be drawn from the above position. In the first place, the "straight line" method of estimating the amount of depreciation is quite unsuitable. For the capitalization of the difference in maintenance charges between old and new properties involves a discount for time. Hence the sinking fund method is the correct one. In the second place, allowance must be made for appreciation resulting from "solidification and adaptation." For these items represent the fact that in some respects the maintenance charges of a new road are not less but greater than those of an old and "seasoned" road. The excessive renewal charges of the old property are to that extent offset by certain higher expenses of the newer one.

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[1] Mr. Allison apparently has this in mind in referring to " theoretical depreciation " as the " cost of establishing business." Report to St. Louis Public Service Commission (1912), p. 21.

The present discussion has attempted to show the utter incongruity between cost new and cost of reproduction. It may perhaps be objected that too much stress has been laid upon a strict theoretical interpretation of replacement cost, with the result that consideration of practical justice is sacrificed to an attempt at logical analysis. Certainly the reproduction theory has grave shortcomings. And even those who accept it in the main, recognize the need for modifications, now in favor of the railroad, now in favor of the public. But the refusal to make any allowance for a decline in value due to age constitutes a departure from principles so serious as to subvert the very foundation of a reproduction cost theory. Perhaps it ought to do so. Perhaps the whole notion of a valuation based on the hypothetical cost of replacing the property is absurd. If so, it should be abandoned. But if retained at all, it should not be surrendered just at that point where it is unfavorable to the railroads. Such a surrender is made if replacement cost new is accepted. For it applies *present* unit prices to *past* physical conditions of structure. It allows maintenance charges made heavy by age, while permitting profits from which every trace of age is absent.

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[1] Whitten, Valuation of Public Service Corporations (1912), pp. 340–341 calls this basis of estimating depreciation the "present worth method." There seems, however, to be no mathematical difference between this and the sinking-fund method, provided that allowance be made in the latter for appreciation as well as for depreciation.

When original cost rather than cost of reproduction is assumed as the basis of valuation, the problem of depreciation becomes more complicated. Part of the foregoing discussion is pertinent also to this situation. But it must be conceded that the argument against a deduction is in this case much stronger. The original cost theory involves a retrospective point of view in which a consideration of actual sacrifice takes precedence over a consideration of values. Without attempting a solution to this problem, I would merely raise one further question: would not Professor Young's objection to the deduction of depreciation constitute *a fortiori* an objection to the original cost theory, even original cost new ? It is unfair, Professor Young thinks, to deduct depreciation, because investors have been given no reason to anticipate the deduction. On the same grounds, then, would it not be unjust to adopt an original cost method, which makes no allowance for appreciation in the value of the property? Investors have been given at least as much reason to count upon a return on these higher property values as to expect a return based on costs undepreciated. Over and against the early court decisions cited by Professor Young as disapproving of the practice of charging off depreciation, must be placed the long series of decisions in favor of replacement cost. Here, then, are two horns of a dilemma: either original cost new, or replacement cost depreciated. Professor Young would reject the latter, as involving *ex post facto* regulation. Must he not on the same grounds also reject the former?

It is not fair to conclude, however, that the objections which Professor Young raises are unreal. The dilemma is a creation, not of false reasoning, but of conditions as they exist. No solution of the problem of valuation as applied to hitherto unregulated utilities can wholly avoid doing injustice to some investors. At best, there must be a compromise. But I submit that replacement cost depreciated, whatever may be its defects in other respects, is less subject to the particular objection of *ex post facto* regulation than is the alternative of original cost undepreciated.

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